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Forest Service
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Subject: Causes of ponderosa pine needle discoloration in the Flagstaff Area

To: Forest Supervisors: Coconino and Kaibab National Forests

Numerous ponderosa pines with bronze foliage are evident now throughout the Flagstaff area including along Highway 180, 89 N (east of Flagstaff), I17 S and Interstate 40 (near Parks), as well as in the vicinity of Sunset Crater, Mountainnaire and Fort Tuthill. The main cause of this discoloration is a species of ponderosa pine needle miner, probably *Coleotechnites ponderosae*. We will confirm this identification in the future. One other species of needleminer is known to affect ponderosa pine in the southwest, *Exoteleia anomala*; however it is reported to infest primarily current years foliage, as opposed to older foliage, as we are seeing in the current outbreak.

Outbreaks of needleminer have been reported here before. The last outbreak occurred in the Flagstaff vicinity in the mid 1980's, though the insect has been detected at low levels at other times. Past experience and research indicates that the damage caused by this insect is mainly unsightly, significant tree mortality has not been observed. While it is certainly possible that some trees already weakened by other circumstances could succumb, we think that most trees will recover from this episode. Examination of currently infested trees this year has revealed healthy new buds (which are currently expanding) as well as last years growth. Please note that this is a different species of needleminer from the one that affects lodgepole pine where significant mortality frequently follows outbreaks!

Ponderosa pine needle miner is a tiny moth. The only host is ponderosa pine. Damage is caused by the the caterpillars, which feed inside pine needles. The caterpillars are quite small only about 3/8 inch long, prior to pupation. The life cycle lasts one year. Larvae hatch in the fall and bore into needles where they overwinter. Feeding resumes in spring and continues until the larvae mature and pupate in late spring early summer. During development usually about 3/4 of the needle is mined. Most mined needles fall in autumn after adult emergence.

Infested trees typically have reddish-brown cast which is distributed throughout the crown. In a forest situation it is not unusual to see some trees more heavily affected than others. It is not known why some trees are affected more than others. Causes could be genetic, site related or a combination of both. This species of needleminer primarily infests older needles and this is quite evident when infested branches are examined up close. Feeding in individual needles causes the needle tip, not the entire needle, to discolor. Infested needles are hollow as a result of the feeding. Often life stages of the insect, including larvae and pupae, can be seen within the needle when held up to light.

Outbreaks of this insect occur sporadically and as mentioned earlier have not been associated with significant tree mortality. It is thought that populations of the moth typically crash due to natural causes, particularly natural enemies. Control in a forest situation is typically not warrented.

If you have questions or concerns about this insect feel free to give us a call, either Bobbe Fitzgibbon (556-2072) or myself (556-2074) are available to assist.

/s/ *Jill L. Wilson*

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